Ken Herstowski

STATE OF MISSOURI

Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

November 25, 2013

Mr. David R. Zoghby
Senior Director of Marketing and
Commercial Contracts
EBV Explosives Environmental Company
dba General Dynamics Ordnances and
Tactical Systems - Munition Services
P.O. Box 1386
Joplin, MO 64802

RE: EBV Explosives Environmental Company - Class 3 Permit Modification
Conference Log on Recent Increasing Perchlorate Concentration in the Groundwater near Expert Management, Incorporated, Facility Boundary
EBV Explosives Environmental Company, Joplin, Missouri
EPA ID# MOD985798164

Dear Mr. Zoghby:

The Missouri Department of Natural Resources (Department) reviewed comments from Ms. Sarah Toevs Sullivan on behalf of Expert Management, Incorporated (EMI), dated September 23, 2013. EMI's comments indicated there was an area of increasing perchlorate concentrations occurring in the groundwater near the southern property boundary of EBV Explosives Environmental Company (EBVEEC).

The Department staff met with you on September 26, 2013, to discuss issues raised in EMI's comment letter, to consider potential reasons for the increasing perchlorate concentrations, and to discuss a path forward to investigate this issue. The meeting was also used to discuss EBVEEC's current and upcoming permitting projects. I have enclosed a conference log of the topics discussed in the meeting from my notes. Please review the enclosed conference log to confirm the issues and path forward discussed in the meeting agrees with your recollection and interpretation of the topics discussed in the meeting.

If you have questions regarding this letter, please contact me at the Missouri Department of Natural Resources, Hazardous Waste Program, P.O. Box 176, Jefferson City, MO 65102-0176, by telephone at (573) 751-3553 or 1-800-361-4827, or by e-mail at jiayi.liu@dnr.mo.gov. Thank you.

Sincerely,

HAZARDOUS WASTE PROGRAM

Jay Liu
Project Manager
Permits Section

JL:mj

Enclosure

c: Ken Herstowski, P.E., Project Manager, U.S. EPA Region 7
Ms. Sheila Hoover, Environmental Manager, Expert Management, Incorporated
Ms. Sarah Toevs Sullivan, Stinson Morrison Hecker LLP
Southwest Regional Office, Missouri Department of Natural Resources

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
CONFERENCE RECORD

File: EBV Class 3 Mod public comment Date: 09/26/2013

SUBJECT: EBV Explosives Environmental Company (EBV) - Class 3 Permit Modification

PERSONS INVOLVED

	Name	Representing
1.	Bill Fanska	Missouri Hazardous Waste Program
2.	Jalal El-Jayyousi	Missouri Hazardous Waste Program
3.	Bruce Stuart	Missouri Hazardous Waste Program
4.	Jiayi Liu	Missouri Hazardous Waste Program
5.	Dave Zoghby	General Dynamics

MEETING SUMMARY:

The Missouri Department of Natural Resources (Department) received comments from Sarah Toevs Sullivan on behalf of Expert Management, Inc. (EMI), dated Sept 23, 2013 during the public comment period for a Class 3 permit modification. The modification request was from EBV Explosives Environmental Company (EBV) d/b/a General Dynamics Ordnance and Tactical Systems (General Dynamics). EBV's property is surrounded by EMI's property. The Class 3 Permit modification request was to expand EBV's business to disassemble and treat Class 1.1 military munitions in a new building #11 and install eight Subpart X miscellaneous treatment units for the demilitarization and treatment of M42/M46/M77 submunitions from Class 1.1 D military munitions.

Based on issues raised in the comment letter, Department representatives met with Mr. Dave Zoghby of General Dynamics on Sept 26, 2013, to discuss the recent increasing perchlorate concentrations detected in the EMI groundwater near the EMI facility boundary. The comment letter indicated there was an area of increasing perchlorate concentrations in the groundwater near the south border of EBV. Ms. Sullivan's contention is that the recent increases in perchlorate concentration detected in EMI's groundwater monitoring wells are related to EBV activities based on the following information:

- Since March 2009, EBV has greatly expanded its demilitarization activities. This increased activity has included incinerating or thermally treating propellants that contain ammonium perchlorate.

- Since EMI's Fall 2010 sampling event, significant increases in the perchlorate concentrations have been detected in monitoring wells MW-27, MW32, MW 76, and MW-137. These wells are hydraulically downgradient from General Dynamics' facility. The EBV operations resides on the hill that sheds runoff to the north toward EMI's North Ditch, east toward Grove Creek, and south toward EMI's north wetlands Ditch (See attached groundwater contour map). The shallow groundwater flows in an east-southeast direction. Storm water on road flows to the Stormwater pond and storm water on most grassy areas flows through ditches to the east side of the property. The wells experiencing increased perchlorate are in this latter area.

- Perchlorate is highly soluble in water and will migrate quickly from soil to groundwater. A rainfall event can be adequate to transport perchlorate from the soil into groundwater and once in the groundwater, will tend to move faster than surrounding water flow due to dispersion.

The Department discussed with Mr. Zoghby the above issues, some potential reasons why EMI would be detecting these increasing perchlorate contaminations, and what types of additional information would be useful to determine the source(s) and any potential further actions that may be necessary. The following topics were discussed as potential areas of further investigation on this issue.

- Testing EMI's monitoring wells with increased perchlorate concentrations for the complementary compound or element that form perchlorate salts such as ammonium (NH_4), calcium (Ca), sodium (Na), and/or potassium (K), to determine if the source of the perchlorate contamination could be traced back to a specific source. Each of these elements or compounds is associated with a perchlorate energetic compound.

- Gathering data from previous years for the other wells located near the North Wetlands Ditch (MW-53, MW-67, MW-68) to look for undiscovered source(s), unidentified residue, or an undocumented spill event and for other chemicals in the ditch area.

- Acquiring and analyzing potentiometric surface maps, bedrock topographic map, and historic groundwater elevation data from the EMI sampling events to determine if an "undiscovered" or "unidentified" source of perchlorate may have been mobilized by groundwater since March 2009.

- Investigating areas of EBV's property including testing water samples from the Plant Water System, Stormwater Pond, Sanitary Pond and TK-103 (Incinerator APCS Pad Collection system) for perchlorates and other related constituents to determine if these sources may be causing or contributing to the increasing perchlorate contamination in the EMI wells.

- Inspecting and investigating the water supply piping buried underground at EBV to determine if the system is leaking and may be a driving force for the increasing perchlorate contamination in the EMI wells.

- Investigating the prevailing wind direction(s) and reviewing data from stack testing at Building #3 and Incineration Complex for perchlorate and other related constituents to determine if the deposition of these contaminants could be the source of the increasing perchlorate contamination in the EMI wells. (Received, dated November 21, 2013)

The meeting also served to address the General Dynamics' demilitarization process and to clarify if the process is regulated under 40 CFR Part 266, Subpart M.

Questions regarding the details of EBV's demil processes and procedures.

Mr. Zoghby explained that the propellant which contains ammonium perchlorate is treated in building #3 and the building is well-sealed to avoid leakage of any spills. In addition, Mr. Zoghby stated that there have not been any recorded spills of ammonium perchlorate inside or outside of building #3.

Building #3 is located at the Northwest corner of the EBV facility, which is on the other side of the facility across a ridge from the EMI wells with the increasing perchlorate contamination. Based on a review of EMI's groundwater contour map, Mr. Zoghby indicated that it seems unlikely that the groundwater would go uphill across the ridge to be able to migrate to the EMI wells located at the Southeast corner of EBV property.

Mr. Zoghby explained the rocket motors containing the ammonium perchlorate based propellant are treated within building #3 using the following processes. The rocket motors are cut into 8 to 10 segments or slices about 1 foot in length using an underwater saw in a water tank. The propellant in each segment is then ignited in a Propellant Thermal Treatment Chamber by a natural gas fired torch and burned. The water from the underwater saws is reused until the concentration of perchlorate exceeds 8%. The water is then removed, filtered, and put into drums, transported to building #6, and burned in the incineration complex. During this process of transporting and incinerating, no water is expected to leak since the drums are sealed in transit and introduced directly into the incinerator in a room with secondary containment with no further processing. The gases from the incinerator are treated through an air pollution control system. The flue gas enters a spray dryer that quenches the gas from 2000 °F to 350 °F and soda ash slurry is injected into the chamber. The flue gas then enters the bag house to collect soda ash and other particulates in the flue gas stream and eventually exhausted through a stack. The flue gas should have minimal amounts of perchlorate emissions after the air pollution control system and is discharged via a stack 65 meters high.

The perchlorate concentrations in the Building #3 stack gases are said to be approximately 2.52×10^{-6} part per million and EBV believes this would not be a significant enough source of perchlorate to be the cause of the increasing perchlorate contamination in the EMI wells.

Mr. Zoghby indicated EBV's willingness to conduct testing on water samples from the Plant Water System, Stormwater Pond, Sanitary Pond and TK-103 (the incinerator air pollution collection system) to discover if abnormal concentrations of perchlorate are present in these areas. The analytical results from these sources were expected to be available by early November and were and were received November 18, 2013.

Additional potential scenarios were discussed that could explain the increase in perchlorate concentrations in the EMI wells by the EBV site.

During the discussion, Mr. Zoghby mentioned that the monitoring wells are located along the North Wetlands Ditch owned by EMI and the ditch used to be a drainage area for TNT production line and an ammonium nitrate manufacturing area. Potentially, there could be an undiscovered source, unidentified residue, or an unrecorded spill event for other chemicals in the ditch area. EMI's groundwater data didn't include perchlorate concentrations for MW-53, MW-67 and MW-68, which could be helpful in resolving this issue.

Bruce Stuart suggested that it might also be beneficial to analyze the groundwater from the EMI monitor wells for other chemicals such ammonium (NH_4), calcium (Ca), sodium (Na), and/or potassium (K). These results may be helpful in determining if the perchlorate increase is resulting from the ammonium perchlorate treated by EBV or from other sources.

A review of the potentiometric maps and water elevation history from EMI's sampling events was needed to determine if a change in groundwater elevations had occurred since March 2009. Since the 2012 drought, it was discussed that there could also be the possibility for related soil cracking to cause groundwater infiltration into a buried or undiscovered underground perchlorate source.

EBV also addressed that General Dynamics' demilitarization process is under regulation at 40 CFR. Part 266 Subpart M. According to Mr. Zoghby, regulation of the demilitarization process was brought up several years ago during a prior public comment period and previously addressed. Documentation should be available in the Hazardous Waste Program file room relating to this issue.

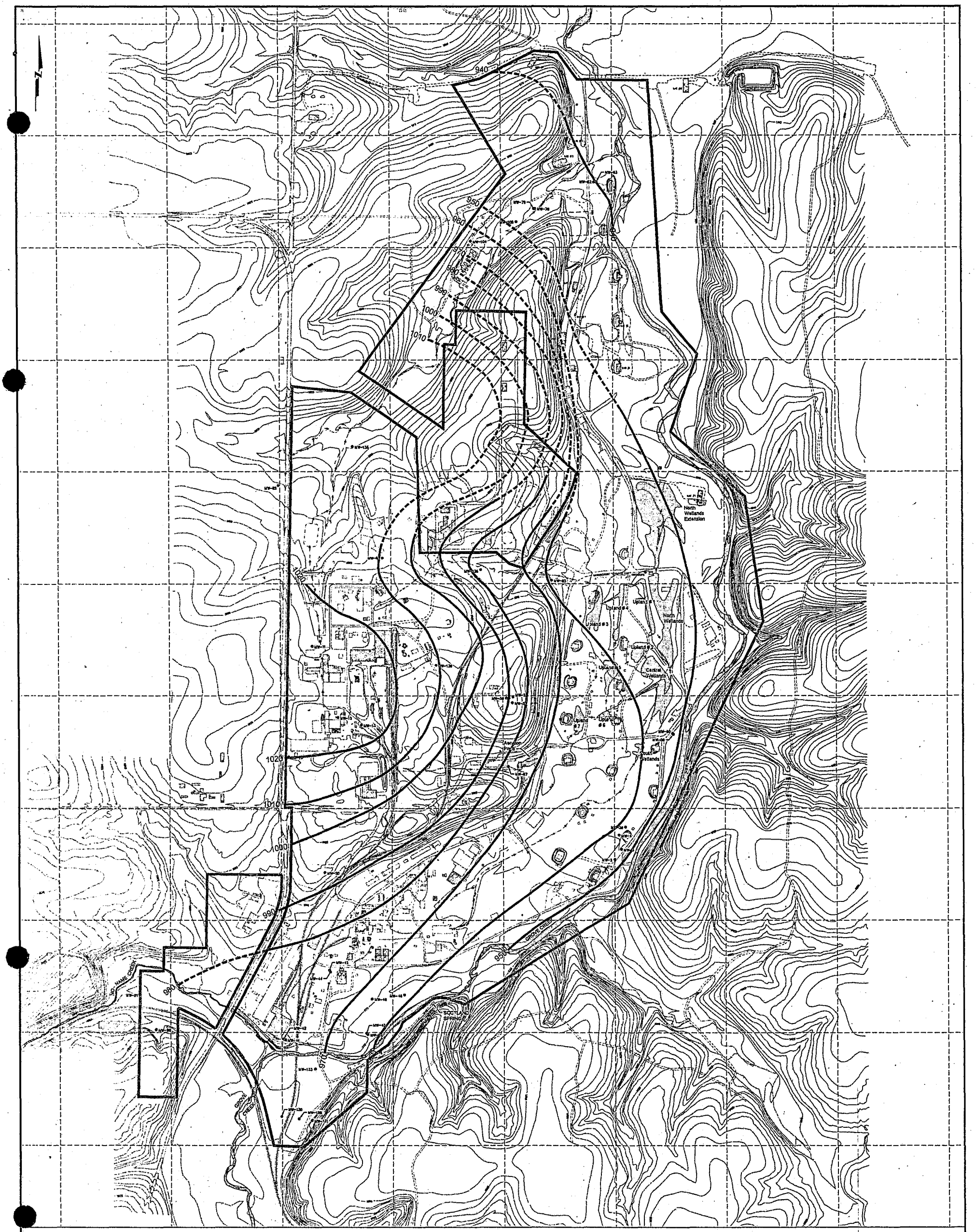
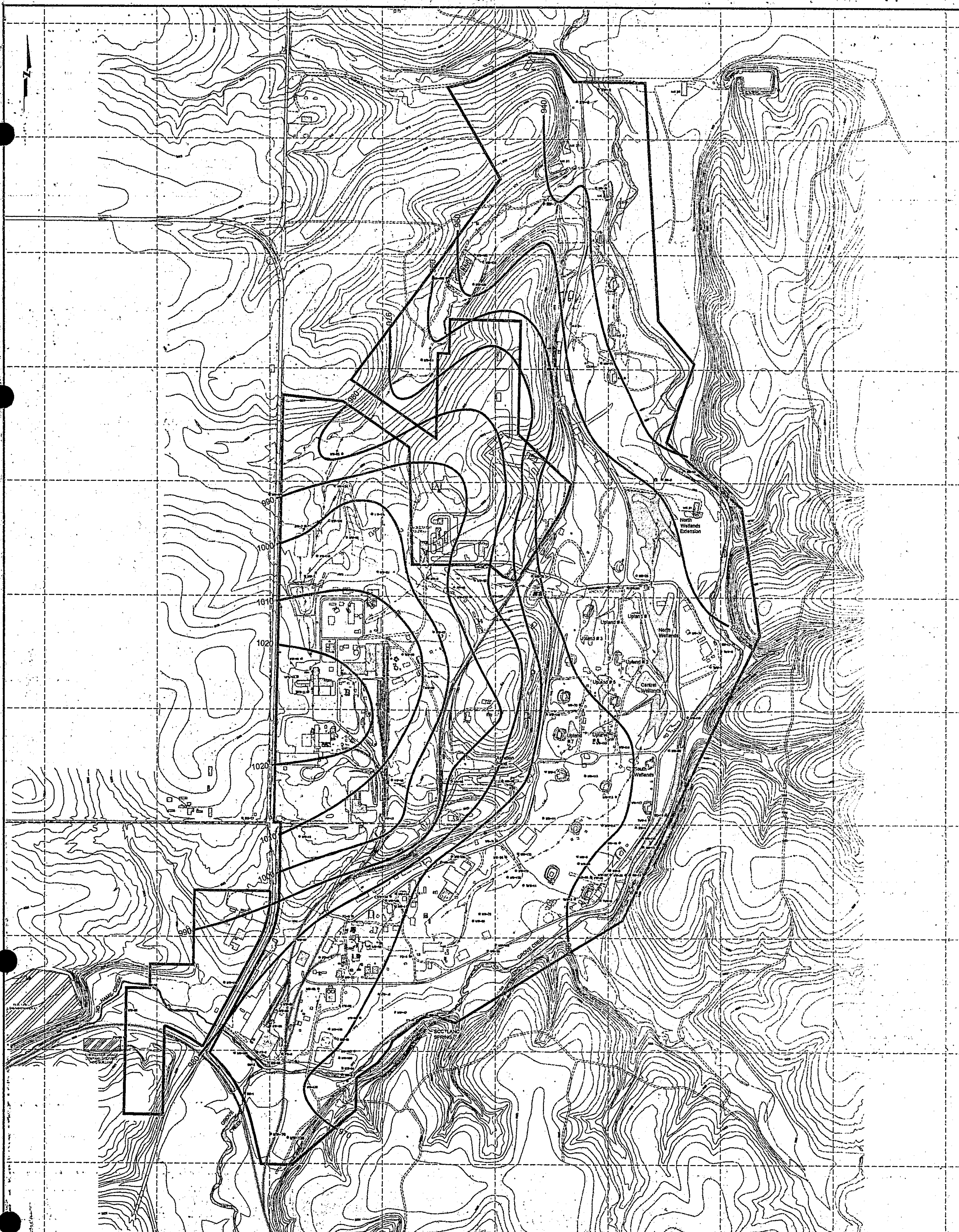


Figure 4-2

EXPERT MANAGEMENT INC.

GROUNDWATER CONTOUR MAP FOR BEDROCK WELLS - OCTOBER 2012
FACILITY MOD077887909
JASPER COUNTY, MISSOURI

DRAWN BY: HMM	DATE: 10/1/13	PROJECT No.: 109178.0008
APPROVED BY: MTS	REVISED: -	



LEGEND:

- BUILDING (REMAINING)
- BUILDING (FORMER LOCATION)
- DIKES
- CONSTRUCTED WETLANDS/PONDS
- TOPOGRAPHIC CONTOUR (2' INTERVALS)
- DRAINAGE DITCH
- FACILITY – PROPERTY BOUNDARY
- FORMER POND
- CREEK
- GROUNDWATER CONTOUR (10' INTERVALS), DASHED WHERE INFERRED
- MW-73 MONITORING WELL OVERBURDEN
- MW-128 MONITORING WELL BEDROCK
- SW-8 SURFACE WATER SAMPLE
- TMW-09 MONITORING WELL TEMPORARY
- PZ-4 PIEZOMETER
- CAS_CC-1(A) SOUTH WETLANDS DITCH
- CAS_CC-1(B) CENTRAL WETLANDS DITCH
- CAS_CC-2 NORTH DITCH
- CAS_CC-3 CONSTRUCTED WETLANDS SYSTEM
- CAS_CC-4 NORTH WETLANDS DITCH

Figure 4-1

EXPERT MANAGEMENT INC.

GROUNDWATER CONTOUR MAP FOR OVERBURDEN WELLS - OCTOBER 2012
FACILITY MOD077887909
JASPER COUNTY, MISSOURI

DRAWN BY: HMM	DATE: 1/31/13	PROJECT No.
APPROVED BY: MTS	REVISED: -	109178 0008